



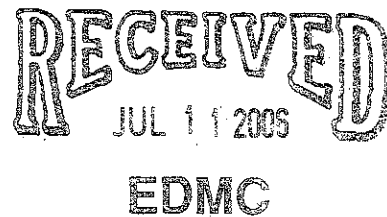
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STATE OF WASHINGTON  
DEPARTMENT OF ECOLOGY

3100 Port of Benton Blvd • Richland, WA 99352 • (509) 372-7950

June 28, 2006

Mr. Don L. Flyckt, Manager  
Liquid Processing and Container Storage  
Fluor Hanford  
P.O. Box 1000, MSIN: S5-31  
Richland, WA 99352



Re: Site Visit of the 200 Area Effluent Treatment Facility (ETF) and Technical Assistance  
Report by the Department of Ecology

Dear Mr. Flyckt:

The Department of Ecology appreciates the time you and your staff spent with us May 11, 2006, during our Technical Assistance Visit and Site Tour of the 200 Area ETF. It provided valuable technical assistance to our newly assigned engineer, Michelle Mandis. Ecology noted that the ETF looked clean and very well maintained. All systems (rough filter, UV-oxidizer, pH adjustment, hydrogen peroxide decomposer, fine filter, degasification column, reverse osmosis membranes, ion-exchange columns, distillate flash tank, heater, vapor compressor, evaporator, thin film dryer, powder hopper, and packaging components) were in stand-by mode with active surveillance on the floor and in the Operations Control Room. Ecology has provided a copy of the site visit notes as an enclosure in this letter.

Before the facility tour, the following piping modifications were discussed:

- Replacing the Liquid Effluent Retention Facility (LERF) return hose line with hard-piping (stainless steel).
- Installation of a stainless steel line in ETF for direct feed into the Secondary Waste Receiving Tank (SWRT). This line will also serve as a recycle line from the LERF Wastewater Feed stream to SWRT in the Secondary Treatment Train passing through the influent filter. (Thus allowing a larger amount of dissolved solids to be removed before the wastewater is sent through the Reverse Osmosis unit in the Main Treatment Train.)

Fluor Hanford (FH) provided a drawing adding a preliminary mark-up of the upcoming piping modifications as indicated in the enclosure. FH then identified to Ecology the physical location of the upcoming piping modifications during the walk down of the facility.

Also discussed during the site visit, was the planned addition of a new solidification treatment unit (STU) which will grout the solids and supplement the Thin Film Dryer. Ecology noted that before the installation and operation of the STU and in accordance with Washington



Mr. Don Flyckt  
June 27, 2006  
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Administrative Code (WAC) 173-240-110, submission and approval of an engineering report, plans and specifications, and submission of the operations and maintenance manual were required (which is defined as the three-step process). Ecology indicated to the Permittee this three-step process could be waived in lieu of conceptual plans per WAC 172-240-110 (5). The Permittee has made this request, and therefore, Ecology agrees to waive the three step process. Ecology provided guidance for the content of the engineering submittal and sent an example report to the facility via email.

If you have any questions, contact me at 509-372-7890.

Sincerely,



Kathy Conaway  
Facility Manager  
Nuclear Waste Program

pll  
Enclosures (2)

cc w/enc:

Nick Ceto, EPA  
Mark French, USDOE  
Joel Hebdon, USDOE  
Oscar Holgado, USDOE  
Mary Jarvis, USDOE  
Ed Macalister, USDOE  
Matthew McCormick, USDOE  
Larry Romine, USDOE  
Sally Sieracki, USDOE  
Raja Ranade, FH  
Roger Szelmechka, FH  
Brent Barnett, PNNL  
Stuart Harris, CTUIR  
Gabriel Bohnee, NPT  
Russell Jim, YN  
Administrative Record: State Waste Discharge Permit ST-4500  
Environmental Portal



STATE OF WASHINGTON  
DEPARTMENT OF ECOLOGY  
WATER COMPLIANCE INSPECTION REPORT

substitute for OMB  
No. 2040-0057  
and EPA form 3560-3  
(Rev. 9-94)  
(last file update 12-95)

FACILITY NAME: ETF

FACILITY NUMBER: ST-4500

SECTION 1: INSPECTION INFORMATION

START DATE: 5/11/06

PRIMARY INSPECTOR M.MANDIS

INSPECTION TYPE (CHECK ONE):

PERMIT # ST-4500

- COMPLIANCE INSPECTION W/O SAMPLING ☐  
COMPLIANCE INSPECTION W/ SAMPLING ☐  
COVERAGE INSPECTION ☐  
COMPLIANCE FOLLOW-UP INSPECTION ☐  
TECHNICAL ASSISTANCE VIST FOR ECOLOGY ☒  
OPERATION & MAINTENANCE INSPECTION ☐

COMPLAINT # \_\_\_\_\_  
LAB PROJECT # \_\_\_\_\_  
ENFORCEMENT DOCKET # \_\_\_\_\_  
Y/N:  
Scheduled Y  
ANNOUNCED Y  
PART OF A GROUP Y

REASON FOR INSPECTION  
(CHECK ONE)

PARTICIPANTS

AGENCY

FAC. REP  
(Y/N)

PHONE #

- ROUTINE ☐  
COMPLAINT ☐  
DRIVE BY ☐  
ENFORCEMENT ☐  
QA ☐  
BIO-MONITORING ☐  
OTHER (SPECIFY) ☒ X  
FAMILIARIZE W/  
FACILITY

R.SZELMECZKA  
K.LUECK  
B.PAVLINA  
D.FLYCKT  
K.CONAWAY  
B.DERRICK  
M.MANDIS

FHI Y 373-4200  
FHI Y 372-3652  
FHI Y 372-9505  
FHI Y 372-3142  
ECY N 372-7890  
ECY N 372-7896  
ECY N 372-7970

SECTION 2: FACILITY INFORMATION

SECTION 3: AREAS EVALUATED DURING INSPECTION

FACILITY: ETF

NAME: EFFLUENT TREATMENT FAC.

ADDRESS: HANFORD

DATE

TIME

ENTRY 1 5/11/06 9:20 AM  
EXIT 1 5/11/06 11:40 AM

ENTRY 2 \_\_\_\_\_  
EXIT 2 \_\_\_\_\_

ENTRY 3 \_\_\_\_\_  
EXIT 3 \_\_\_\_\_

ENTRY TYPE  
(CHECK ONE)

- DENY ☐  
DELAY ☐  
WARRANT ☐  
REGULAR ☒ X

N = NOT EVALUATED, S = SATISFACTORY

M = MARGINAL, U = UNSATISFACTORY

INSPECT BENCH SHEETS S  
INSPECT PERMIT N  
RECORDS/REPORTS S  
FLOW MEASUREMENTS S  
LABORATORY S  
EFFLUENT/RECEIVING WATER N  
  
PRE-TREATMENT N  
COMPLIANCE SCHEDULES S  
SELF MONITORING PROGRAM S  
OPERATION & MAINTENANCE S  
SLUDGE DISPOSAL S  
FACILITY SITE REVIEW S  
LAB ACCREDITATION N  
OTHER (SPECIFY) N

**SECTION 4: SUMMARY OF FINDINGS / COMMENTS (ATTACH ADDITION PAGES IF NEEDED)**

SEE ATTACHED NOTES.

**SECTION 5: FOLLOW-UP (CHECK ALL THAT APPLY)**

TYPE	DETAIL	RESP. PERSON	SCHEDULE	DONE
<input type="checkbox"/> CONDUCT CLASS II	_____	_____	_____	_____
<input type="checkbox"/> LAB ACCRED MANUAL	_____	_____	_____	_____
<input type="checkbox"/> RE-INSPECT	_____	_____	_____	_____
<input type="checkbox"/> RE-OPEN PERMIT	_____	_____	_____	_____
<input type="checkbox"/> SEND APPLICATION	_____	_____	_____	_____
<input checked="" type="checkbox"/> TECH ASSIST-REGULAR	<u>DETERMINE TYPE OF ENGR</u>	<u>K.CONAWAY/</u>	<u>6/06</u>	<u>5/06</u>
<input type="checkbox"/> TECH ASSIST-OUTREACH	<u>REQUIREMENT FOR STU</u>	<u>M.MANDIS</u>		
<input type="checkbox"/> MOD PERMIT AT RENEWAL	_____	_____	_____	_____
<input checked="" type="checkbox"/> FACILITY ACTION	<u>ENGR MEMO &amp; DWG</u>	<u>R.SZELMECZKA</u>	<u>8/06</u>	<u>IN</u>
<input type="checkbox"/> ENFORCEMENT (WARN LET	<u>REQUIRED FOR STU</u>			<u>PROG</u>
<input type="checkbox"/> NOV, ORDER, PENALTY)				<u>5/31/06</u>
<input checked="" type="checkbox"/> OTHER (SPECIFY)	<u>UPDATE PERMIT APP</u>	<u>R.SZELMECZKA</u>	<u>8/06</u>	<u>IN</u>
<i>(completed task)</i>	<i>Ecology approved permit App w/ supplemental info</i>			<u>PROG</u>
<input type="checkbox"/>	_____	_____	_____	<u>6/12/06</u>

**SECTION 6: ACTIVITIES (CHECK ALL THAT APPLY)**

DESCRIPTION	DATE COMPLETED	TRACKING NUMBER
<input type="checkbox"/> DATA RECEIVED FROM LAB	_____	_____
<input type="checkbox"/> DRAFT INSPECTION REPORT COMPLETED	_____	_____
<input type="checkbox"/> FINAL INSPECTION REPORT COMPLETED	_____	_____
<input type="checkbox"/> FINAL INSPECTION RPT RCD FROM EILS	_____	_____
<input type="checkbox"/> FORM 3506 SENT TO EPA	_____	_____
<input type="checkbox"/> INSPECTION REPORT REVIEWED	_____	_____
<input type="checkbox"/> SAMPLES TO LAB	_____	_____
<input type="checkbox"/> OTHER	_____	_____

**SECTION 7: SIGNATURES**

	NAME (PRINT)	SIGNATURE	DATE	AGENCY/PH#
INSPECTOR 1	M. MANDIS	<i>Michelle A. Mandis</i>	<i>6/1/06</i>	ECY/372-7970
INSPECTOR 2	C. CONAWAY	<i>Kathleen A. Conaway</i>	<i>6/1/06</i>	ECY/372-7890
REVIEWER	D. SINGLETON	<i>Deborah Singleton</i>	<i>6/1/06</i>	ECY/372-7923

### ETF (ST-4500) Site Tour Notes (Ecology)

Ecology traveled to ETF to tour the facility 5/11/06. Process flow was explained and a diagram and drawing were distributed. Upcoming modifications to the facility were discussed before the tour including:

- Replacing the LERF Return hose line with hard-piping (stainless steel).
- Installation of a stainless steel line in ETF for direct feed into the Secondary Waste Receiving Tank (SWRT). This line will also serve as a recycle line from the LERF Wastewater Feed stream to Secondary Waste Receiving Tank (SWRT) in the Secondary Treatment Train passing through the influent filter. (Thus allowing a larger amount of dissolved solids to be removed before the wastewater is sent through the Reverse Osmosis (RO) unit in the Main Treatment Train (MTT)).

Discussion turned to Ecology's Engineering requirements for the modifications. Required notification for the piping modifications were provided during this visit. Ecology will add this Technical Assistance Report (with attached notes and drawings) in the Ecology ETF facility Water Quality file.

Also discussed was the addition of a new solidification treatment unit (STU) which will grout the solids and supplement the Thin Film Dryer. Before the installation and operation of the STU and per WAC 173-240-110, submission and approval of an Engineering Report, submission and approval of Plans and Specifications, and submission of an Operation and Maintenance Manual are required for any modification of the industrial wastewater facility. The ETF facility has requested that Ecology waive the requirement of the three step submission of documents in lieu of conceptual plans per WAC 172-240-110 (5). Ecology has agreed to the waiver of the three step process and requesting that the submittal contain:

1. Introduction
  - Objective of the new (STU) unit
  - Background description of current plant operation (thin film dryer)
  - Current solid waste requirements
  - Current solid waste characterization
2. Description of Proposed Modifications (STU)
  - Reason for modification
  - Overall effects of the unit on the facility and other units it impacts
  - Changes/Modifications required in the facility to support the STU
  - A timetable of final design and construction
  - A vicinity map showing the location of the STU
  - An engineering drawing of STU

These requirements were documented in an example report sent to the facility 5/23/06 via email. A tour of the site followed the facility modifications discussions.

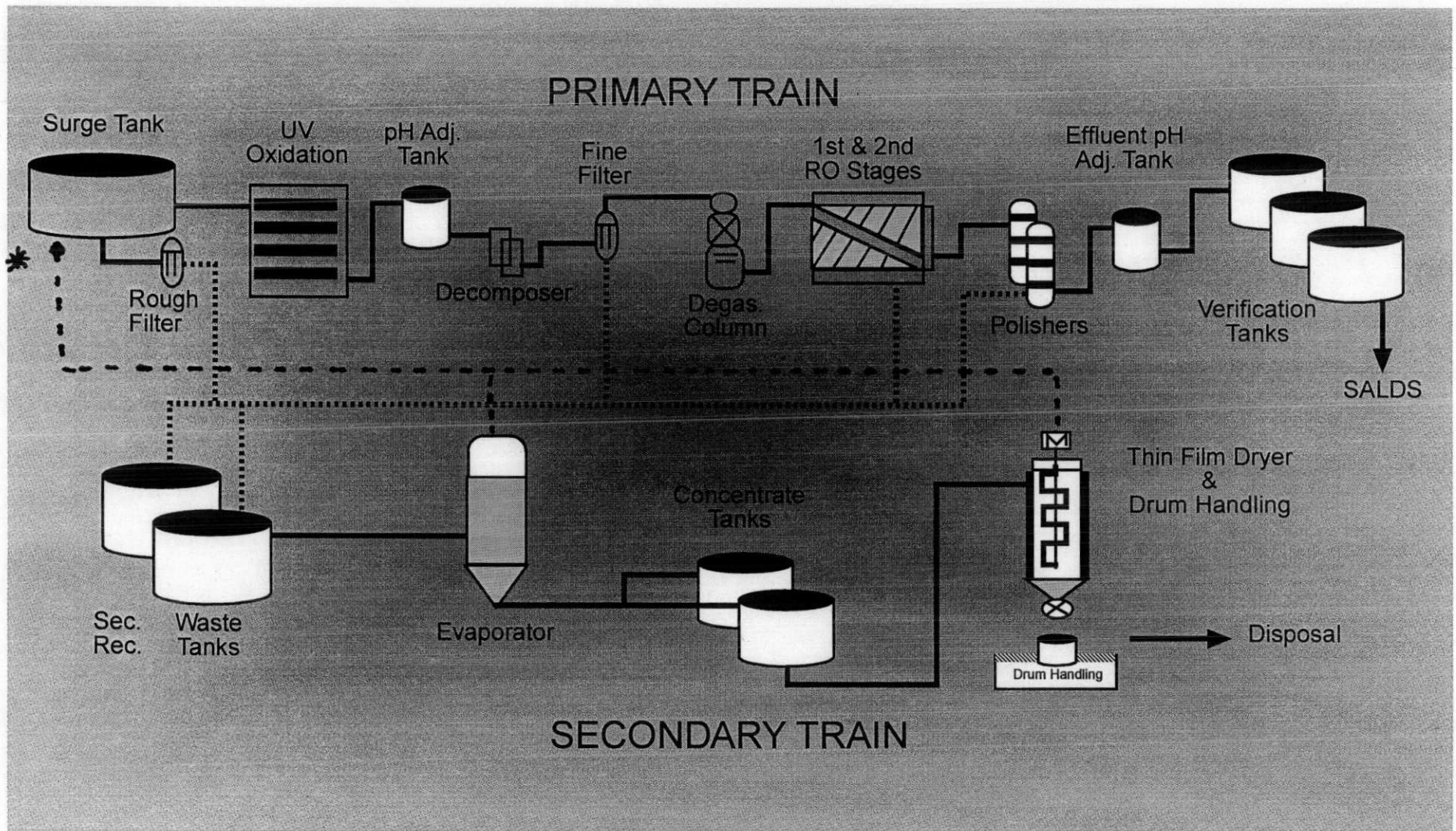
During the Ecology visit, the facility was in stand-by mode, meaning that the facility was not actively treating wastewater. Ecology toured the Operations Control room first and noted that the facility had a state-of-the-art operations control program to monitor the entire facility and various properties of each unit including, but not limited to: liquid levels/flow, operational status, amperage, rotor speed, etc. Both process flow diagram and graphical views of the properties as listed above are readily accessible. The control equipment also reports equipment malfunctions and alarms. The alarm system indicates levels of concern by color. Red alarms indicate the equipment is critical and immediate attention is required. Yellow alarms indicate the equipment is important and the condition will require attention but is not time urgent. White alarms indicate that the alarm is informational. There are two operational indicators which are green and gray.

Green indicators show that the equipment is either operational or running (on). Grey indicators shows that the equipment is non-operational or not running (off). LDC screens and Audible alarms are also present on the facility floor. The Control room is staffed 24-hours per day and 7-days a week.

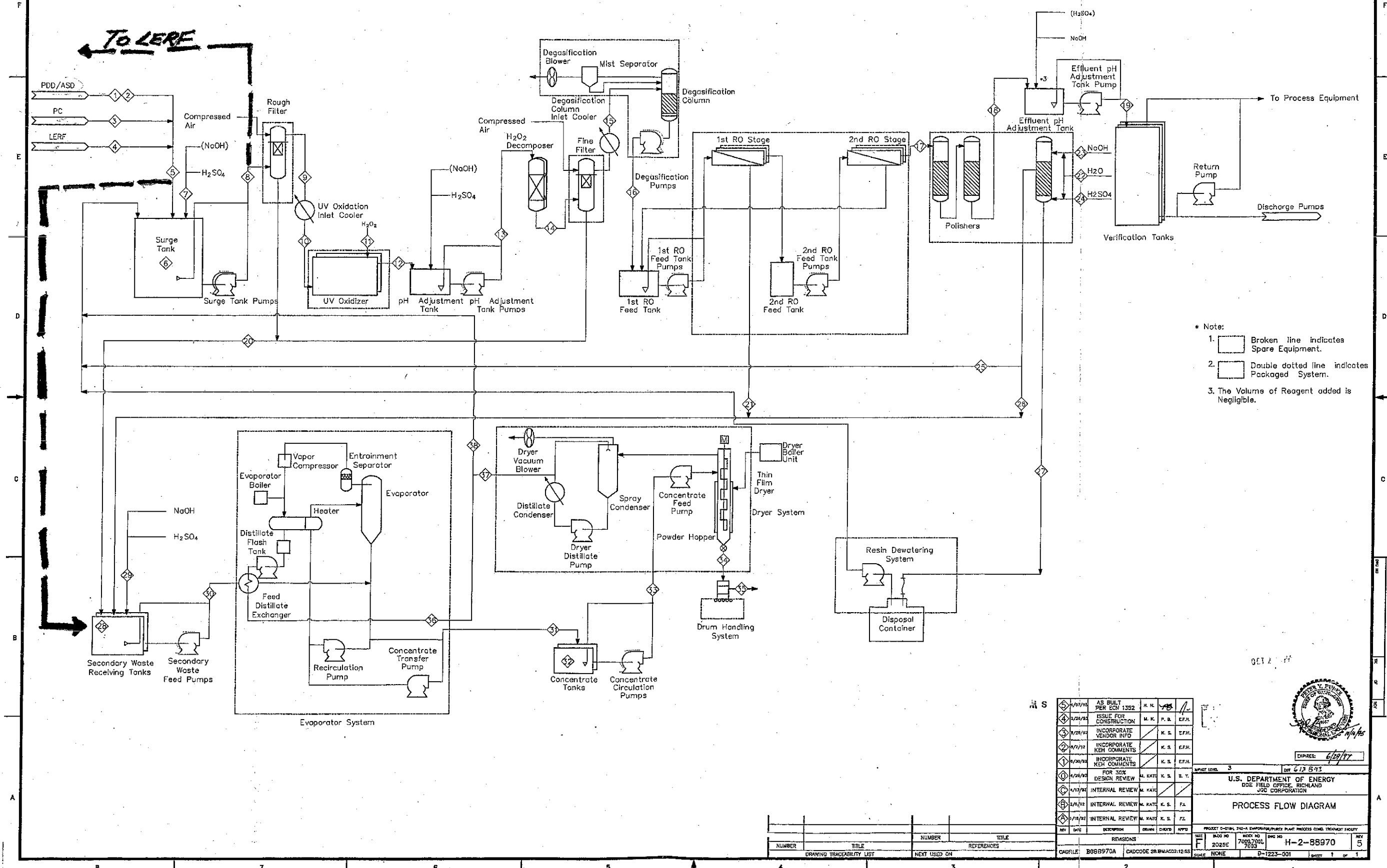
Ecology then Aced in and entered the facility. The Primary Treatment Train comprised of influent pipes, surge tank, rough filter, UV-oxidizer, pH adjustment tank and pH adjustment chemical storage tanks, hydrogen peroxide decomposer, fine filter, degasification column, reverse osmosis feed tank and membranes, three ion-exchange columns (standard rotating and regeneration operations), and effluent pH adjustment tank. It was noted that the wastewater treated contains a very low amount of organics. Thus, the UV-oxidizer sufficiently destroys any organics present and rarely is the hydrogen peroxide and pH adjustment functions needed. However, these units are kept operational and maintained for potential use. The effluent pH adjustment unit is also maintained for future potential use; however, it is not actively utilized either. While viewing the three (3) ion-exchange (polishing) columns, it was noted that the media has lasted 12 years. However, column 1 will require new media in the near future. Also noted during the visit was the flex pipe that will be replaced with hard pipe and the approximate path/location of the LERF influent line to the STT.

Ecology then toured the Secondary Treatment Train. The Second Treatment Train consists of the secondary waste receiving tanks, distillate flash tank, heater, evaporator and boiler. The solids slurry then travels to concentrate tanks, thin film dryer and powder hopper and are packaged in the drum handling system and routed out by conveyor tray to a storage area within the facility and moved to the drum load-out facility and disposed appropriately as RCRA waste per the ETF RCRA permit. The overheads are routed through a vapor compressor and back to the heater. Energy is conserved as much as possible and the steam from the evaporator is used in the heater. Also included in the Second Train is the resin dewater system and disposal container. The drum load out facility and location of STU was then shown to Ecology and the site visit was concluded.

# ETF Process Flow



\* And additional Feedback Loops



- \* Notes:
- 1. Broken line indicates Spare Equipment.
  - 2. Double dotted line indicates Packaged System.
  - 3. The Volume of Reagent added is Negligible.

1/1/78	AS BUILT PER ECN 1352	M. K.	P. B.	E. F. H.
1/25/78	ISSUE FOR CONSTRUCTION	M. K.	P. B.	E. F. H.
1/25/78	INCORPORATE VENDOR INFO	K. S.	E. F. H.	
1/27/78	INCORPORATE KEH COMMENTS	K. S.	E. F. H.	
1/30/78	INCORPORATE KEH COMMENTS	K. S.	E. F. H.	
1/26/78	FOR SQA DESIGN REVIEW	M. KATU	K. S.	B. Y.
1/13/78	INTERNAL REVIEW	M. KATU		
1/2/78	INTERNAL REVIEW	M. KATU	K. S.	F. A.
1/18/78	INTERNAL REVIEW	M. KATU	K. S.	F. L.
1/18/78	REVISION	DR. KATU	D. KATU	APPD

U.S. DEPARTMENT OF ENERGY  
DOE FIELD OFFICE, RICHLAND  
JGC CORPORATION

PROCESS FLOW DIAGRAM

PROJECT: C-204-242-A EVAPORATOR/PURGE PLANT PROCESS COND. TREATMENT FACILITY

REV 5

DATE: 2025E

7050700L

H-2-88970

9-1223-001

NUMBER	TITLE	NUMBER	TITLE
1	PROCESS FLOW DIAGRAM	2	PROCESS FLOW DIAGRAM
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